EUROPEAN SCIENCE FOUNDATION
SETTING SCIENCE AGENDAS FOR EUROPE

Durham University

EUROCORES Programme
European Collaborative Research

EUROQUAM SATELLITE MEETING ON COLD AND ULTRACOLD MOLECULES

17-18 April 2009 • Durham • United Kingdom

Cold Quantum Matter (EuroQUAM) EUROCORES Programme

Quantum Matter is matter in which all the constituent atoms and molecules are in a single quantum state and behave coherently as a single quantum object. The field of Cold Quantum Matter is complex and draws on atomic and optical physics, chemical physics and physical chemistry, plasma physics, statistical physics, solid-state physics and quantum chemistry. Although the field is driven by fast advances in experimental capabilities, theoretical work is essential to guide experiments and explain their results. The EuroQUAM programme provides vital opportunities for scientists from different disciplines and countries to collaborate, and in particular stimulates collaborations between experiment and theory.

The EuroQUAM programme is composed of six Collaborative Research Projects (CRPs):

- Quantum Simulation using cold atoms in optical lattices (DQS)
- Fermionic Mixtures of Ultracold Atoms: Pairing, Superfluidity and Quantum Phases (FerMix)
- Collisions of Cold Polar Molecules (CoPoMol)
- Controlled Interactions in Quantum Gases of Metastable Atoms (CIGMA)
- Cavity-Mediated Molecular Cooling (CMCC)
- Quantum-degenerate dipolar gases of bialkali molecules (QuDipMol)

Scope of the meeting

Recently there have been many important advances in our ability to produce and trap samples of cold and ultracold molecules. The new capabilities open up many exciting prospects and offer enormous scope for applications in fields ranging from precision measurement and high-resolution spectroscopy to ultracold chemistry and quantum information processing. This one-day meeting follows "Faraday Discussion 142: Cold and Ultracold Molecules" and highlights the role of research groups within the EuroQUAM programme at the forefront of this exciting field.

Practical arrangements

For travel information to Durham University consult:
http://www.dur.ac.uk/travel/todurham/
Further information on the local arrangements will be posted on the Durham Atomic and Molecular Physics Group website:
http://massey.dur.ac.uk/

Programme 18 April 2009

9:15	**Cold and ultracold polar molecules,** Jun Ye, *JILA, National Institute of Standards and Technology and Univ. of Colorado, USA*	Keynote Talk
10:00	**Hyperfine-changing collisions of cold molecules,** Jesus Aldegunde, *Department of Chemistry, Durham University, UK.*	CoPolMol
10:30	Morning Coffee	
11:00	**Observation of an Efimov spectrum in an atomic system,** Matteo Zaccanti, *LENS and Physics Department, Università di Firenze, Italy.*	QuDipMol
11:30	**Cavity cooling of the internal and external motion of molecules,** Regina de Vivie-Riedle, *Ludwig-Maximilians-Universität München, Germany.*	CMMC
12:00	**Towards sympathetic cooling of molecules with ultracold atoms,** Adela Marian, *Fritz-Haber-Institut der Max-Planck-Gesellschaft, Berlin, Germany.*	ColPolMol
12:30	Lunch (Collingwood College)	
2:00	**Understanding Feshbach molecules with long range quantum defect theory,** Paul Julienne, *National Institute of Standards and Technology, Gaithersburg, USA.*	Keynote Talk
2:45	**Interacting Bosonic and Fermionic atoms in 3D optical lattice potentials,** Sebastian Will, *Johannes Gutenberg-Universität Mainz, Mainz, Germany.*	DQS
3:15	**Collisional properties of heteronuclear mixtures with resonant interspecies, Interaction,** Jesper Levinsen, *Université Paris Sud, Orsay, France.*	Fermix
3:45	Afternoon Tea	
4:15	**Critical fluctuations of an attractive Bose gas in a double well potential,** Marek Trippenbach, *Institute of Theoretical Physics, Warsaw University, Warsaw, Poland*	CIGMA
4:45	**Cold guided beams of polar molecules,** Laurens van Buuren, *Max-Planck-Institut für Quantenoptik, Garching, Germany*	CMMC
5:15	**What do you care about what molecules are?** Olivier Dulieu, *Laboratoire Aimé Cotton (LAC), Orsay, France.*	QuDipMol
5:45	Close	

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Programme

	Friday 17 April
13:30 – 15:00	Scientific committee meeting (Penthouse Boardroom, Collingwood College)
15:00 – 17:00	Laboratory tours (Sign up on sheet in Appleby theatre)
17:45	Meet outside Physics Department to walk to Durham Cathedral
18:30 – 22:00	Tour of Durham Cathedral & Dinner at the Undercroft Restaurant
	Saturday 18 April
9:15 – 17:45	Conference talks (In Ph8 – James Duff lecture theatre in Physics Department)
19:30 –	Dinner at Collingwood College